FOR.A®
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

# OPERATION MANUAL

## TCR Plugin

Brainstorm Time Code Camera Data Recorder

2nd Edition - Rev.2

Version 2.0

FOR-A COMPANY LIMITED

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# Upon Receipt

## Unpacking

TCR and its accessories are fully inspected and adjusted prior to shipment. Operation can be performed immediately upon completing all required connections and operational settings.

Check your received items against the packing lists below.

| ITEM | QTY | REMARKS |
|---|---|---|
| TCR installation disk | 1 | CD-ROM |
| Operation manual | 1 | |

## Check

Check to ensure no damage has occurred during shipment. If damage has occurred, or items are missing, inform your supplier immediately.

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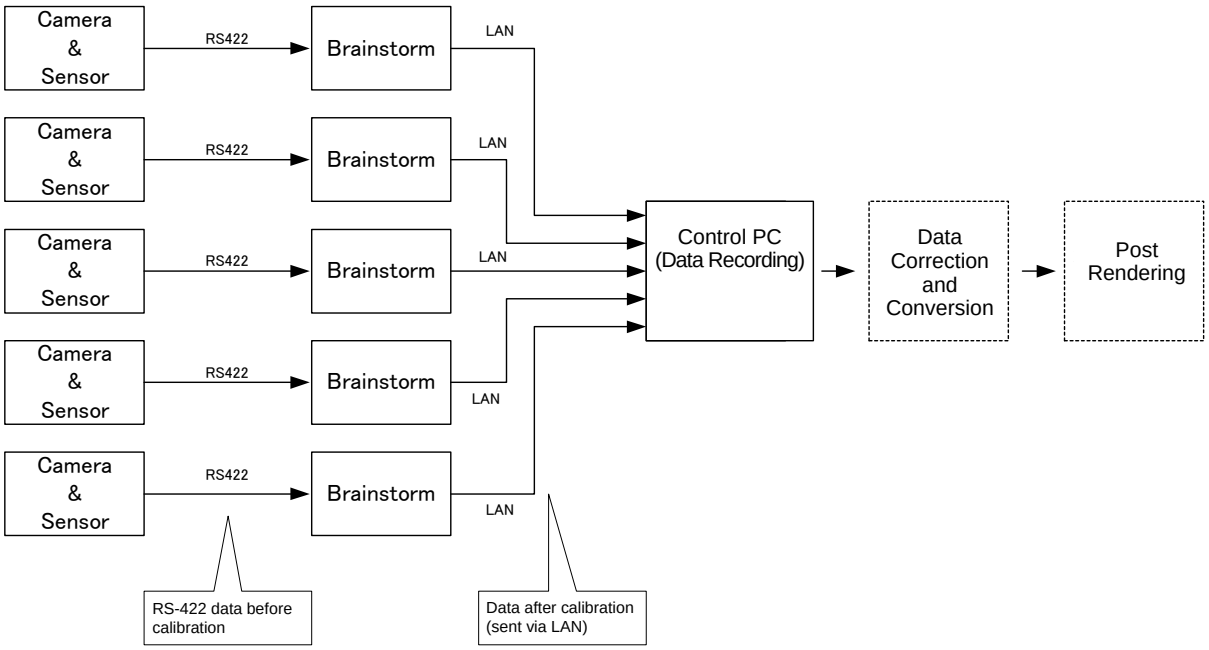
# 1. Overview

## 1-1. System Overview

TCR Plugin is a software program that allows you to record virtual system sensor data that is synced to the camera in real time and use the recorded data for post rendering. The original sensor data is sent via RS-422. At this stage, the lens curve or position change information between the studio and virtual set is not included. Such information is generated after the calibration is completed in Brainstorm. TCR sends and records camera data after the calibration via LAN. It also has features that allow you to efficiently use recorded data for post rendering and edit the data.



## 1-2. Software Structure

TCR Plugin (TCR.py):
Plug-in software for Brainstorm. It allows you to send and receive camera data via LAN after calibration.

TcrGuiConfigure:
Runs on the control PC and allows you to set the destination, frame rate, and time code (drop frame or non-drop frame) settings of TcrGui described later.

TcrGui:
Runs on the control PC, controls multiple virtual processors simultaneously, and records camera data. It also loads data from the recorded file and sends it to virtual processors. It has a feature to check data using time code.

TcrEdit:
An editing program that allows you to check data and correct data gaps and errors. It also has a feature to convert files to Maya or dotXSI format.

**NOTE**

Only one TcrGuiConfigure can be run at a time.
Only one TcrGui can be run at a time.
TcrGuiConfigure and TcrGui cannot be run at the same time.
If the above program is started while another copy is already running, the message as shown below appears.

## 1-3. System Requirements

| | |
|---|---|
| Model | PC/AT |
| CPU | Intel® Core™2 Duo 1GHz or faster (or equivalent) |
| Memory | 1GB or more |
| OS | Windows® XP SP2 operating system or later (32bit) |
| Display | Resolution of 1024 x 768 pixels or better.<br>Must be capable of full color display. |
| Network port | At least one 100BASE-TX/1000BASE-T compatible port |

# 2. Preparation

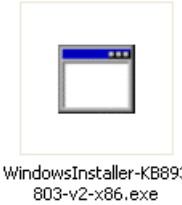
## 2-1. Software Installation

This section describes how to install **Windows Installer 3.1**, **Notepad++**, **npp.5.9.2.ConfigTCR**, and **TCR**.

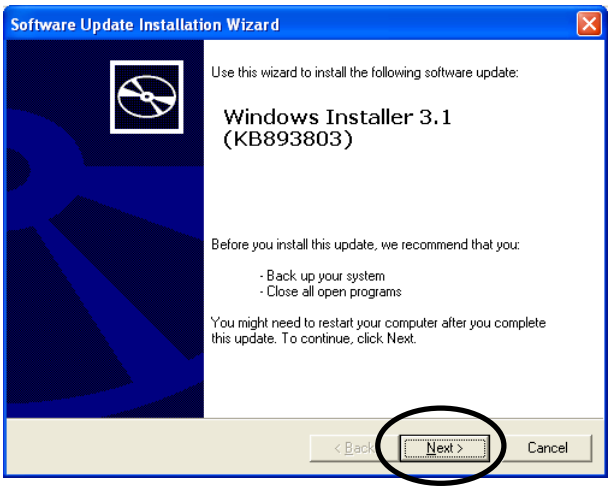
| **IMPORTANT** |
| --- |
| This installation must be done as a user with administrator privileges. |

### 2-1-1. Installing Windows Installer 3.1

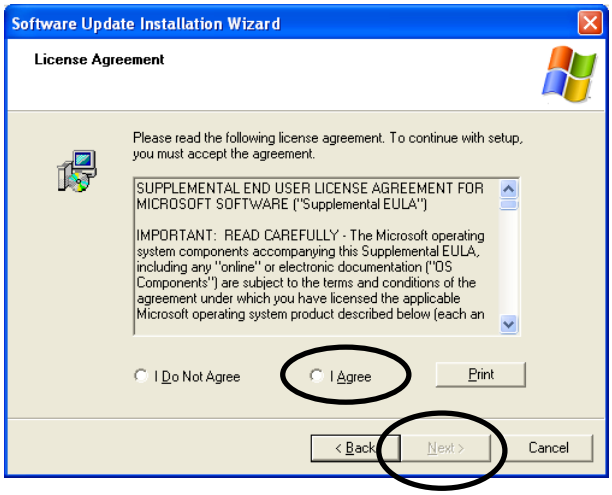
(1) If **Windows Installer 3.1 (v2)** is not installed on you computer, double-click **\Microsoft\WindowsInstaller-KB893803-v2-x86.exe** on the CD-ROM to run the wizard. However, if you are using Windows7, this installation is not needed.



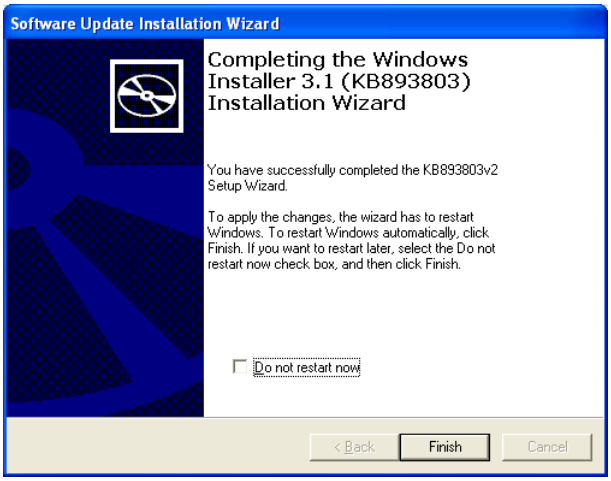

(2) Click **Next**.




(3) Select **I agree** and click **Next**.

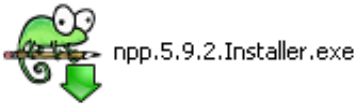


(4) After the installation is complete, you will be asked to restart your computer. Click **Finish** to restart your computer.




## 2-1-2. Installing Notepad++

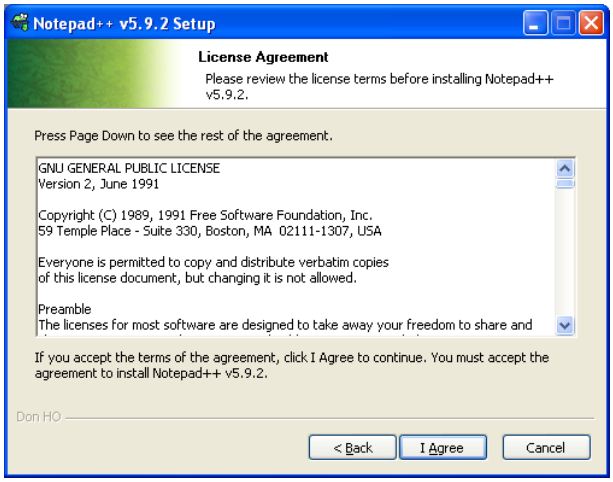
(1) Double-click **npp.5.9.2.Installer.exe** on the CD-ROM to run the setup wizard.



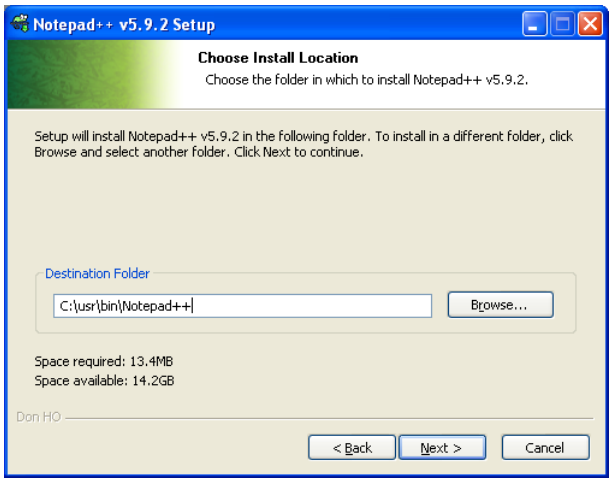

(2) Click **OK**.

(3) Click **Next**.

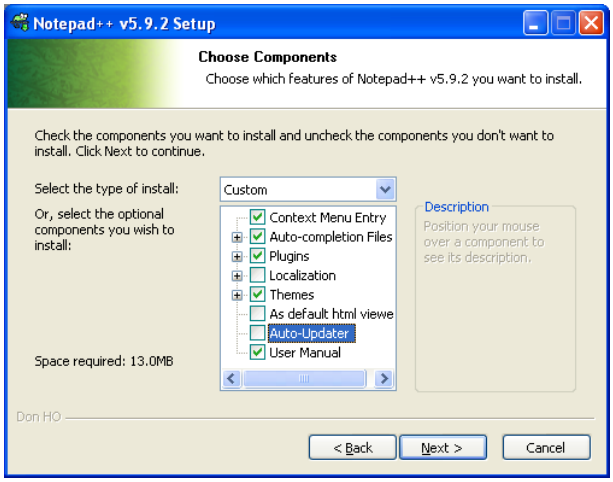
(4) Click **I Agree**.



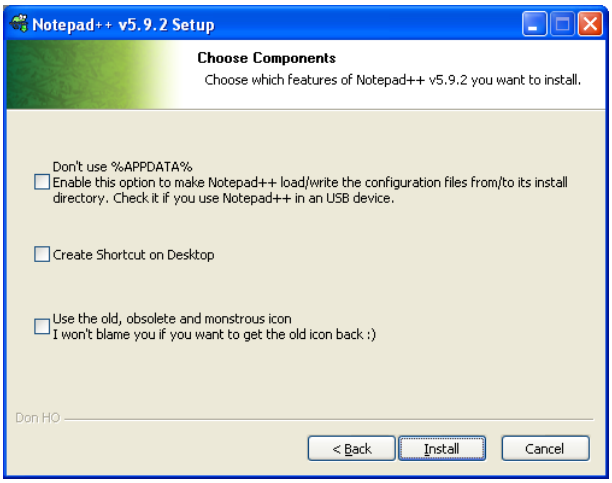

(5) Specify **C:\usr\bin\Notepad++** for **Destination Folde**r and click **Next**.



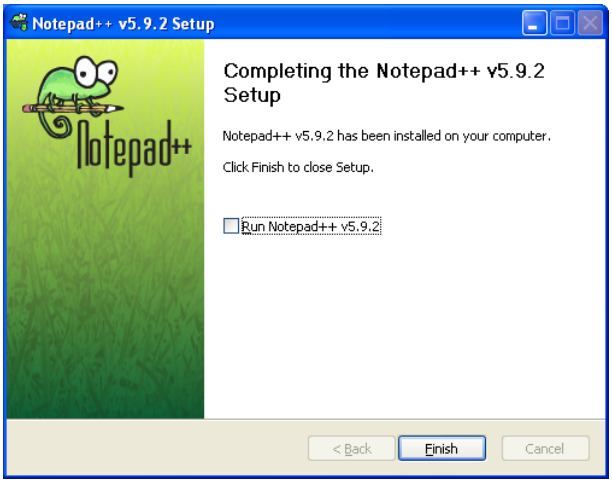

(6) Uncheck the **Auto-Updater** checkbox and click **Next**.



(7) Click **Install**.

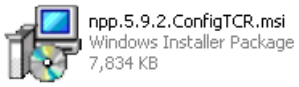



(8) Uncheck the **Run Notepad++ v5.9.2** checkbox and click **Finish**.



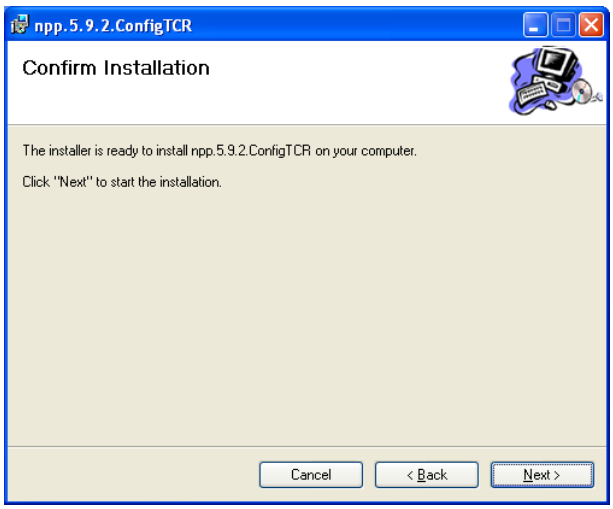
## 2-1-3. Installing npp.5.9.2.ConfigTCR

(1) Double-click **npp.5.9.2.ConfigTCR.msi** on the CD-ROM to run the setup wizard.

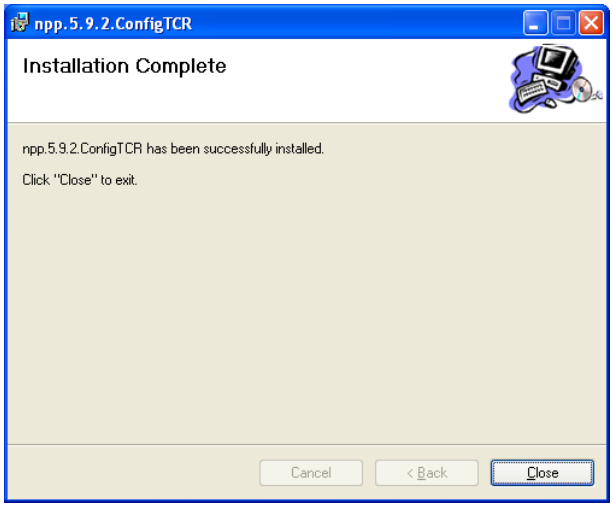



(2) Click **Next**.

(3) Click **Next**.



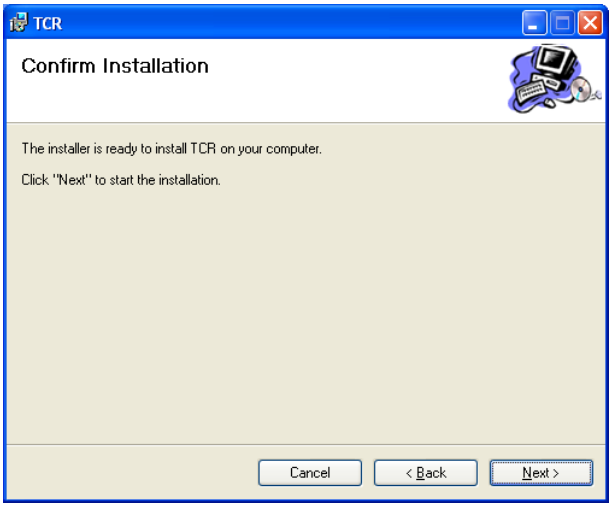

(4) Click **Close**.



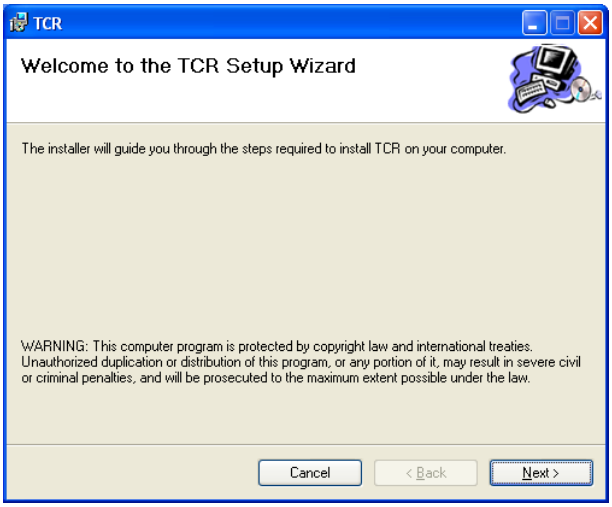
# 2-2. Installing TCR

(1) Double-click **TCR.msi** on the CD-ROM to run the setup wizard.

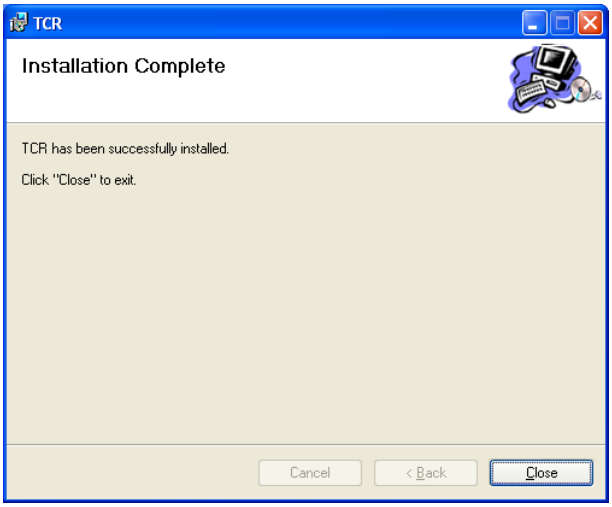
(2) Click **Next**.




(3) Click **Next**.




(3) Click **Close**.



# 3. TCR Plugin for Brainstorm

TCR Plugin is a software program that allows you to record Brainstorm camera data to other virtual processors or to a file. The time code data can also be sent and used for post rendering.

## 3-1. Adding the TCR.py Plug-in Module

TCR Plug-in is located under the following directory:
C:\usr\FOR-A\TCR\v2\BrainstormPlugin\TCR.py

Adding this Dbs (database) to the Loader used for the program enables its functions. Avoid moving the above data directly to the Loader as it is the original data. For example, assuming that the Program A data is all under **Folder A**, the procedure will be as follows.

① Copying TCR.py
Copy the following data to Folder A.
C:\usr\FOR-A\TCR\v2\BrainstormPlugin\TCR.py
C:\usr\FOR-A\TCR\v2\BrainstormPlugin\TCR

② Adding to Loader
Set the Dbs name for **TCR.py** to **TCR**. Although the file name **"TCR.py"** can be changed to **TAR1.py**, **TCR2.py**, or such, the Dbs name must be set to **TCR** as the example below.

itemnew("dbs", "<>TCR", ← Set the Dbs name to **TCR**.
"DBS_FILE", "TCR.py") ← The file name can be changed from **TCR.py**.

itemnew("dbs", "<>testScene",
"DBS_FILE", "testScene.py")

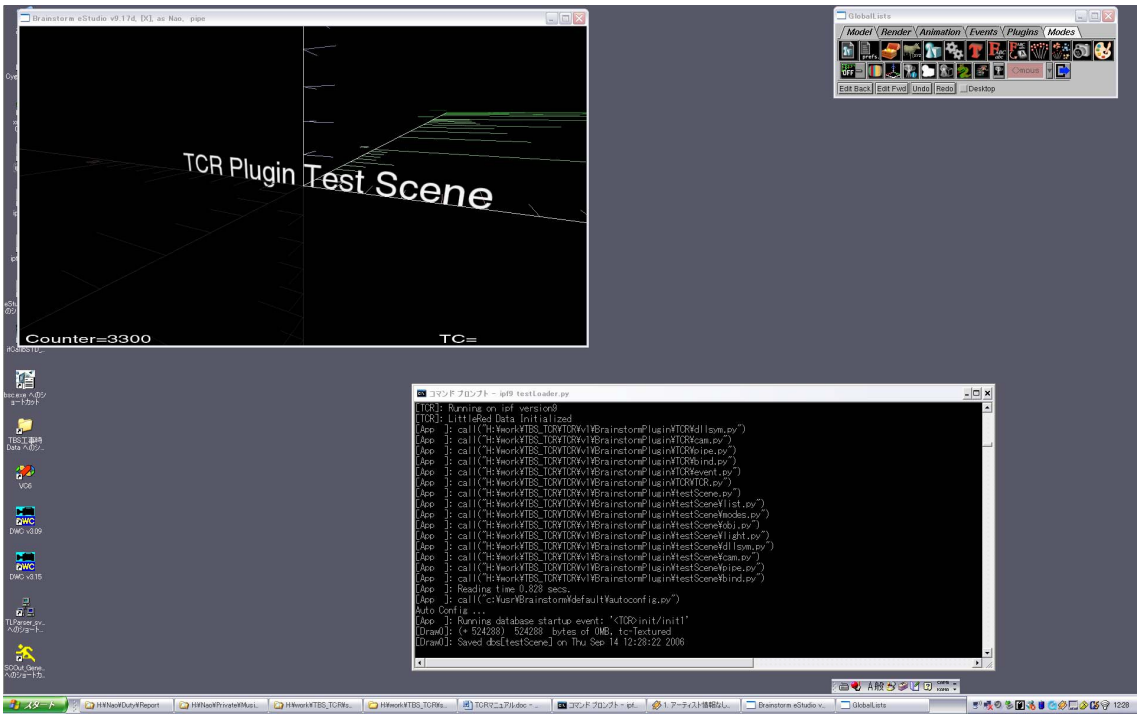
The above guidelines must be followed since **TcrGui** (described later) remotely controls Brainstorm through the **<TCR>TCR1** item as default. This setting can be changed by setting **Item Name** in **TcrGuiConfigure** or **itemName** in the **TcrGui.ini** file.

*The Dbs name in **TcrGui.ini** and Loader must be the same.

# 3-2. Using TCR Plugin

## 3-2-1. Starting TCR Plugin

Copy all files under **C:\usr\FOR-A\TCR\v2\BrainstormPlugin** to a folder. After starting Brainstorm and loading **testLoader.py**, the windows as shown below appear.



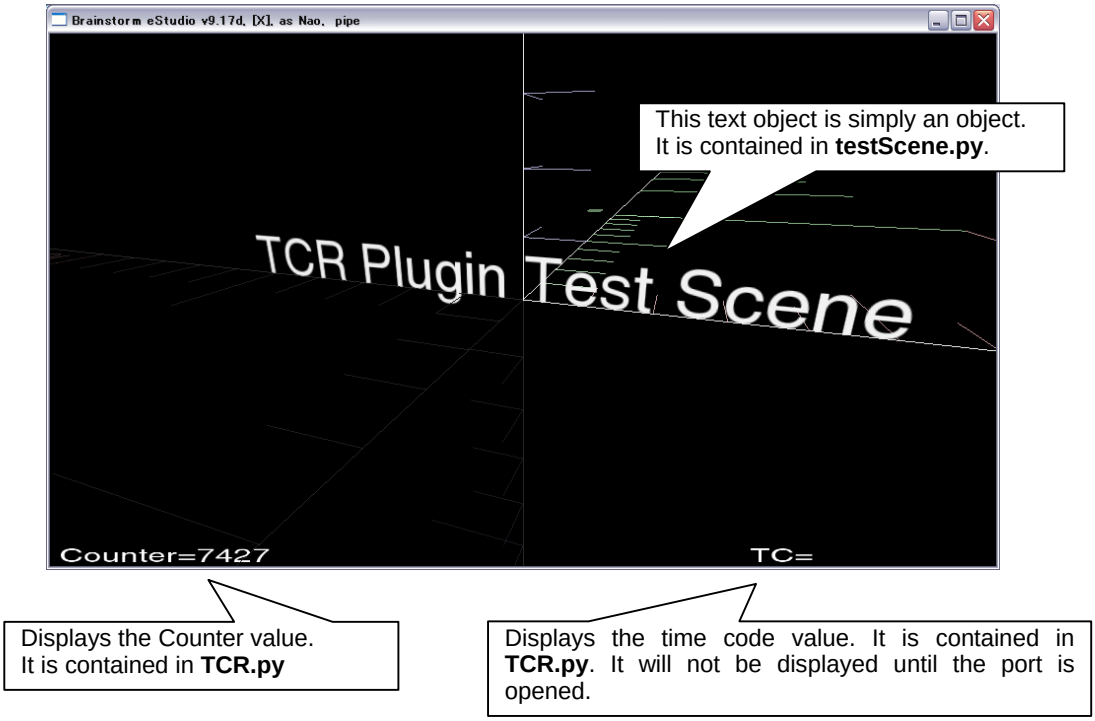

**testLoader.py** is formatted as below.

```
itemnew("dbs", "<>TCR",
    "DBS_FILE", "TCR.py")

itemnew("dbs", "<>testScene",
    "DBS_FILE", "testScene.py")
```

**TCR.py** and **testScene.py** load the Dbs.

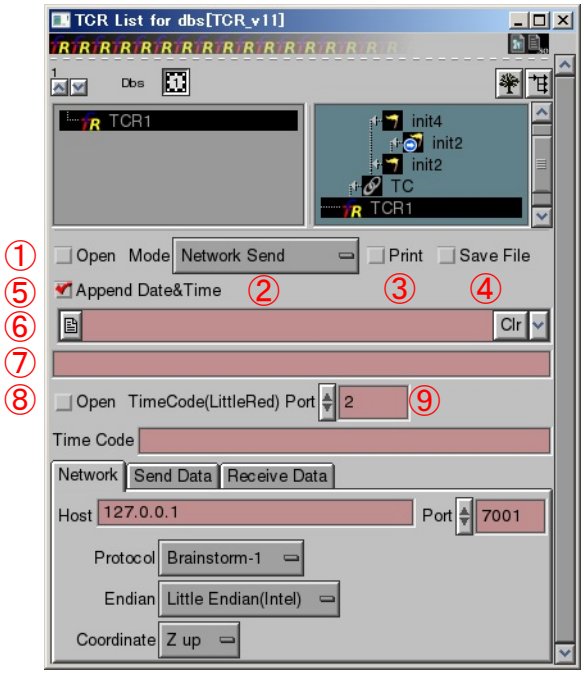
The TCR Plugin functions are all handled by **TCR.py**, and **testScene.py** simply contains scene data. **testScene.py** will be the graphic data used for an actual program.

After **testLoader** is loaded, the GFX window appears as below.




## 3-2-2. TCR Plugin

Under the **Plugins** tab in **GlobalLists** or **ListsLayout**, open **TCR List**. A window as shown below appears.




| **IMPORTANT** |
| --- |
| There exists an item labeled “TCR1”.<br>Do not change this item name since **TcrGui** (described later) remotely controls Brainstorm through the <TCR>TCR1 item as default.<br>This setting and the item name for **TCR.py** must be the same. |

① Open (TCR_OPEN)
Starts to send, receive, and record camera data according to the mode setting (②).

② Mode (TCR_MODE)
The following modes are available.

| | |
|---|---|
| NetworkSend | Sends camera data to the host specified under the **Network** tab. |
| Network Recieve | Receives camera data. |
| File Write | Records camera data to the specified file, without sending or receiving data via network. |
| File Read | Loads camera data from the specified file, without sending or receiving data via network. |
| Network Recieve2 | Requests the source host to send camera data and receives data. |

③ Print (TCR_PRINT)
Displays the following data to Brainstorm DOS Prompt, according to the Mode setting (②).

| | |
|---|---|
| Network Send | Displays the data being sent and recorded. |
| FileWrite | |
| Network Recieve | Displays the received data. |
| Network Recieve2 | |
| File Read | Displays the data loaded from a file. |

④ Save File (TCR_SAVE)
Shown in **Network Send** or **Network Recieve** mode only. It allows you to record data being sent or received to a file.

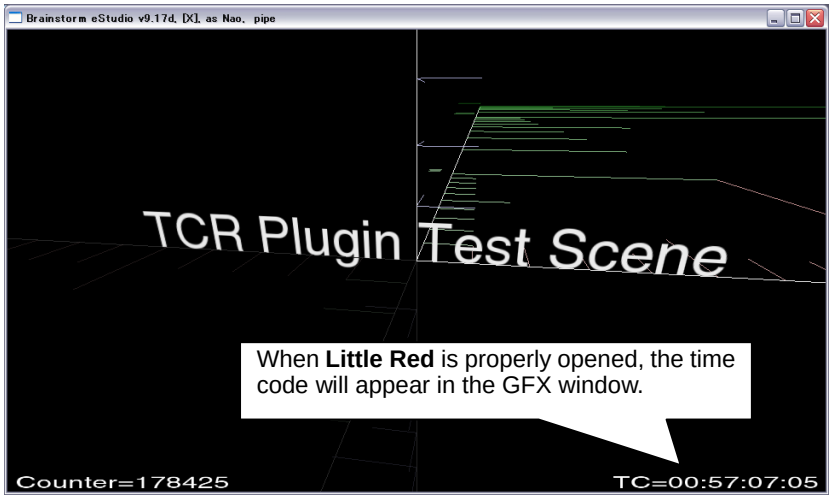
⑤ Append Date&Time (TCR_APPEND_DATE)
Appends date and time of when **Open** is turned on to the specified file.

⑥ File name (TCR_SAVE_FILE)
Allows you to specify the file name for recording.

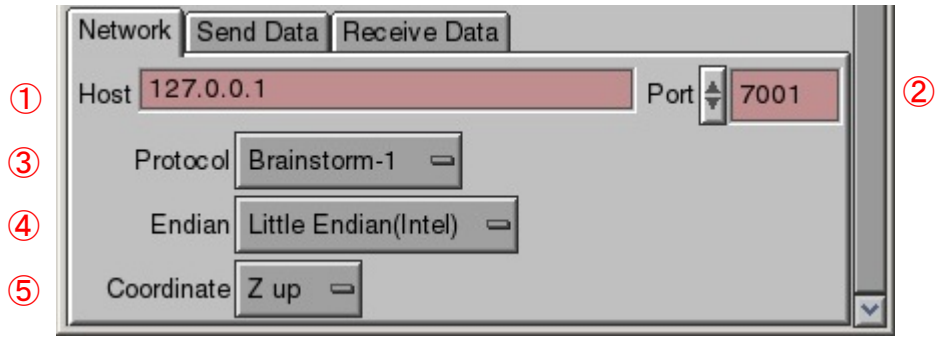
⑦ File name with date and time (TCR_SAVE_FILE_WDT)
Displays the file name specified in ⑥ followed by the date and time.

⑧ Open (TCR_LITTLERED_OPEN)
Starts loading time code.

⑨ Time Code (LittleRed) Port (TCR_LITTLERED_PORT)
Specifies the destination port on the time code reader, **Little Red**.



<Network Tab>




① Host (TCR_HOSTNAME)
Specifies the destination IP address or host name for **Network Send** mode.

② Port (TCR_PORT)
Specifies the network port for **Network Send** or **Network Recieve** mode. The port number for receiving and sending must be the same.

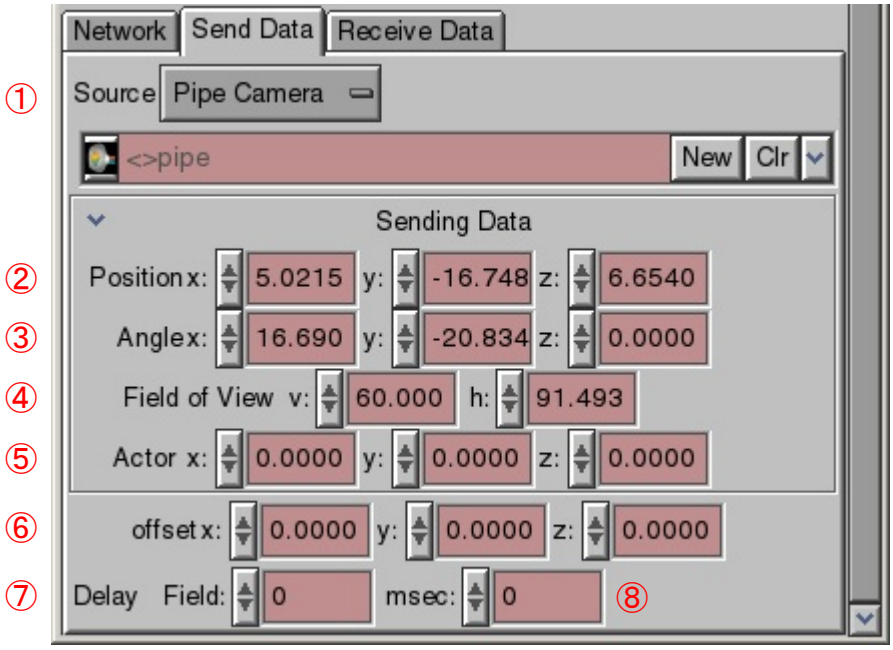
③ Protocol (TCR_PROTOCOL)
The following protocols are supported.

| | |
|---|---|
| VizRT-1 | Sends the **Counter**, **Position** (x, y, z), **Angle** (h, p, r), and **Field of View** (v, h) parameters. It also sends **Actor** parameters (x, y, z), which are user-defined parameters. The time code parameter is not included. |
| Brainstorm-1 | Basically the same as **VizRT-1** except that this protocol also sends the time code parameter. |
| VizRT-TC | Basically the same as **VizRT-1** except that this protocol also sends the time code parameter using the Actor data area. Since the Actor data area is used by the time code, the Actor parameters cannot be set. |

④ Endian (TCR_ENDIAN)
A read-only parameter that is changed according to the **TCR_PROTOCOL** setting (③). The parameter will be **BigEndian** if **VizRT-1** or **VizRT-TC** is selected for **Protocol**, and **LittleEndian** if **Brainstorm-1** is selected.

⑤ Coordinate (TCR_COORDINATE)
A read-only parameter that is changed according to the **TCR_PROTOCOL** setting (③). The parameter will be **Y up** if **VizRT-1** or **VizRT-TC** is selected for **Protocol**, and **Z up** if **Brainstorm-1** is selected.

<Send Data Tab>




① Source (TCR_SEND_SRC)
The following modes are available.

| | |
|---|---|
| Pipe Camera | Sends camera data that is selected for **<>pipe** in **Brainstorm**. |
| Camera | Sends data of the specified camera item. |
| Manual Bind | Directly binds to the camera data described in steps ② through ⑤ below instead of sending data. |

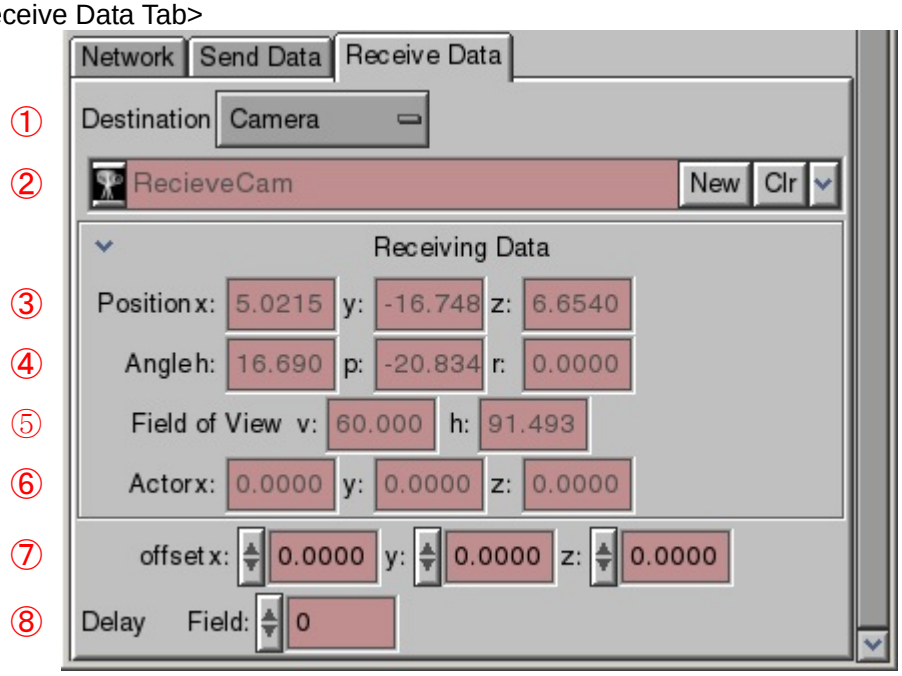
② Position (TCR_SEND_XYZ)
③ Angle (TCR_SEND_HPR)
④ Field of View (TCR_SEND_FOVV, TCR_SEND_FOVH)
⑤ Actor (TCR_SEND_ACTOR_XYZ)
Displays the data to be sent. **Position**, **Angle**, **FOVV**, and **FOVH** will be read-only while sending data if **Source** is set to **PipeCamera** or **Camera**. If **TCR_PROTOCOL** is set to **VizRT-TC**, **Actor** will be hidden

⑥ Offset (TCR_SEND_OFFSET)
Allows you to offset the **Position** values.

⑦ Delay Field (TCR_SEND_DELAY)
Delays sending data by the specified field unit.

⑧ Delay msec (TCR_SEND_DELAY_MS)
Delays sending data by the specified millisecond amount.

<Receive Data Tab>




① Destination (TCR_RECIEVE_DEST)
Specifies how the received data is used. The following modes are available.

| | |
|---|---|
| Camera | Applies the received data to the specified camera item. |
| Manual Bind | Binds the received data to the specified parameters. |

② Camera (TCR_RECIEVE_DEST_CAM)
Displayed if **TCR_RECIEVE_DEST** (①) is set to **Camera**. Allows you to specify a camera item to which the received data is applied.

③ Position (TCR_RECIEVE_XYZ)
④ Angle (TCR_RECIEVE_HPR)
⑤ Field of View (TCR_RECIEVE_FOVV, TCR_RECIEVE_FOVH)
⑥ Actor (TCR_RECIEVE_ACTOR_XYZ)
Displays the received data. If **Offset** parameters (⑦) are specified, the adjusted parameters will be displayed.

⑦ Offset (TCR_RECIEVE_OFFSET)
Allows you to offset the **Position** values.

⑧ Delay Field (TCR_RECIEVE_DELAY)
Delays receiving data by the specified field unit.

# 3-3. Notes on Using TCR Plugin

## 3-3-1. Dbs Name and Item Name

Although **TCR Plugin** can be used independently, it is assumed to be used with **TcrGui**. To control through **TcrGui**, the Dbs name and item name must be the same as those in **Brainstorm**. In **TcrGui**, the **Dbs** name and item name can be specified using **TcrGuiConfigure** or **TcrGui.ini**.

[Setting]
HostMax=5
itemName=<TCR>TCR1
…

[Host1]
Address=digistorm1
Port=7001
Alias=C1

[Host2]
…

Set the Loader file and item name of the TCR List according to the Dbs name and item name specified above.

## 3-3-2. Notes on Adding Items

Network communication between virtual processors should be a direct, one to one connection. Do not send data from a single virtual processor to multiple virtual processors, although it is possible to do so by adding items to the TCR List. In order to avoid operational failures, the **New** button in the TCR List is hidden

## 3-3-3. Recorded Data Format

The format of the recorded file will be z-up regardless of the **TCR_PROTOCOL** setting (VizRT-1, Brainstorm-1, or VizRT-TC).

## 3-3-4. Synchronizing Multiple Virtual Processors

By sending camera data to other virtual processors, multiple virtual processors can be synced to a single camera. In such case, the camera sync delay may be different between virtual processors. If this is the case, follow the steps below.

① Set **Source** (TCR_SEND_SRC) under the **Send Data** tab to **Camera**, click the down arrow button (TCR_SEND_SRC_CAM), and specify the camera item.

② Set **Destination** (TCR_RECIEVE_DEST) under the **Receive Data** tab to **Camera**, click the down arrow button (TCR_RECIEVE_DEST_CAM), and specify the camera item. In most case, specify **RecieveCam** under **TCR.py**.

③ In **Brainstorm**, set the **<>pipe** camera (PIPE_CAMERA) to the same setting as **TRC_RECIEVE_DEST_CAM** (②).

**Example**
Virtual Processor 1 receives camera data from ifCalibSTD cam1
↓
Virtual Processor 1 sends data to Virtual Processor 2 (①) > Virtual Processor 2 receives the data and applies it to the virtual set
↓
Virtual Processor 1 applies the camera data to its **RecieveCam** (②)
↓
Brainstorm applies the RecieveCam data to the virtual set (③).

If the virtual processor you are operating is faster than the others, increase the **Delay** value of **Receive Data**. On the contrary, if it is slower than the others, adjust the **Delay** value of **Send Data**.

Note that if **Pipe Camera** is specified for **Send Data** in step ① above, the source and destination will be looped and synchronization will stop.

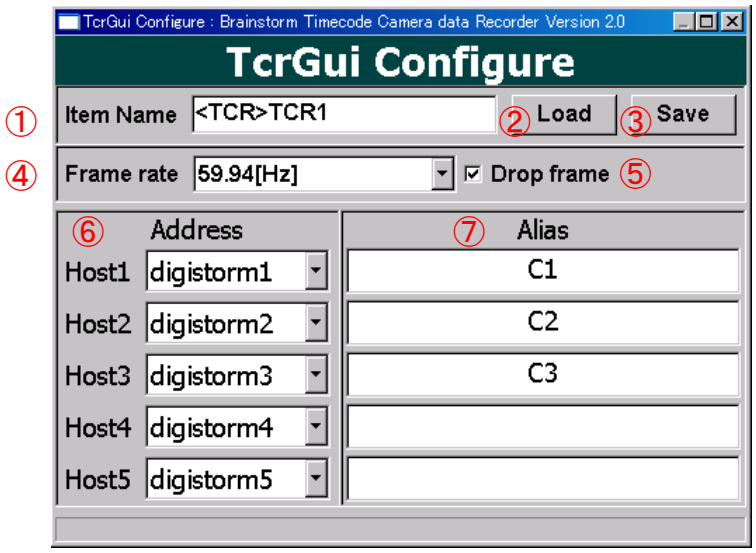
# 4. TcrGuiConfigure

**TcrGuiConfigure** is a software program that allows you to modify the **TcrGui.ini** file. The destination host setting for **TcrGui**, the item name of the **TCR List** controlled through **TcrGui**, the frame rate and time code type (drop frame or non drop frame) settings used in **TcrEdit** can be set through **TcrGuiConfigure**.

## 4-1. Starting TcrGuiConfigure

The executable file is located under the following directory.
C:\usr\FOR-A\TCR\v2\Gui\TcrGuiConfigure.exe

After the .exe file is started, the **TcrGui.ini** file will automatically load and a window as shown below will appear. Set the settings and click the **Save** button to save settings to **TcrGui.ini**. After closing **TcrGuiConfigure**, **TcrGui** will automatically start.




① Item Name
Allows you to specify the item name of the TCR List controlled through **TcrGui**.

② Load
Loads the **Tcr.ini** file.

③ Save
Saves the current settings to the **Tcr.ini** file.

④ Frame rate
Allows you to set the frame rate. To use 1080i/59.94, select **59.94[Hz]**. The frame rate specified here is used by **TcrEdit** (described later).

⑤ Drop frame
Allows you to set the time code type. To set to drop frame, select the checkbox. To set to non-drop frame, deselect the checkbox. The time code type that is set here is used by **TcrEdit**.

⑥ Address
Allows you to select the host name or IP address that **TcrGui** (described later) connects to. If you do not wish to set the host to be connected, select **Not Used**.

⑦ Alias
Allows you to set the name displayed under **Virtual Prosessor** in **TcrGui**. Since the name that is set here is used by the **Maya** and **dotXSI** data output through **TcrEdit**, use one-byte alphanumeric characters only.

## 4-2. Editing the Destination Host

The destination host settings are written under the **[Setting]** section in **TcrGuiConfigure.ini**. Up to 10 host names can be specified.

```
[Setting]
Address1=digistorm1
Address2=digistorm2
Address3=digistorm3
Address4=digistorm4
Address5=digistorm5
```

# 5. TcrGui

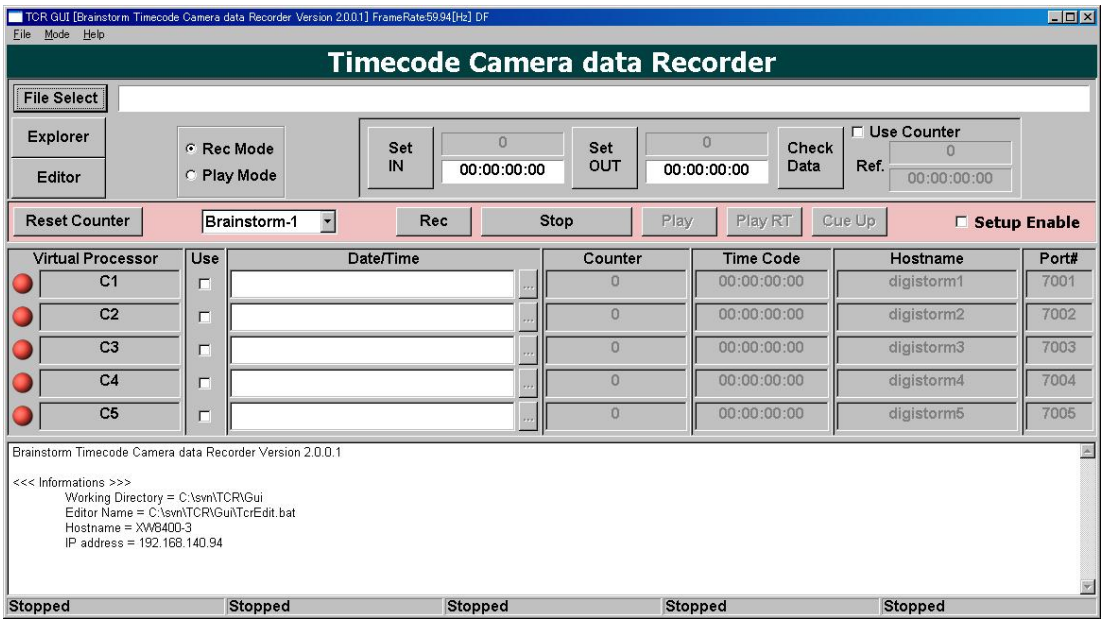
**TcrGui** is a software program that works in conjunction with **TCR Plugin** for **Brainstorm**, records camera and time code data for post rendering, and check data

## 5-1. Starting TcrGui

The executable file is located under the following directory.

C:\usr\FOR-A\TCR\v2\Gui\TcrGui.exe

After the program is started, the following window appears.

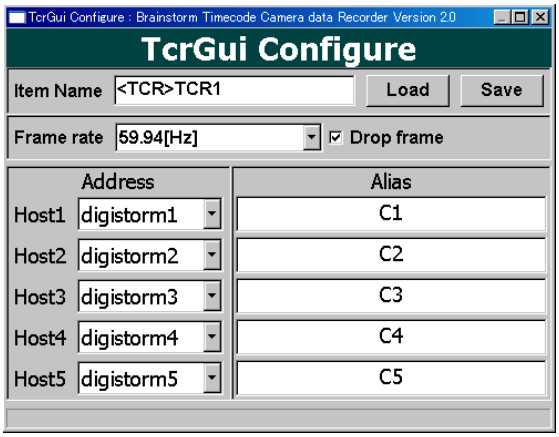


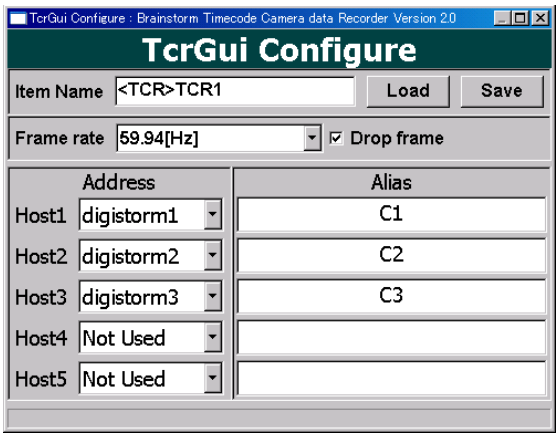

## 5-2. Initial Setup

There may be a situation where Brainstorm is used in multiple sub control rooms in a broadcast station (for example, virtual processors 1 and 2 are used in control room A, and virtual processors 3 and 4 are used in control room B), and usually the same domain is used in the same network. In such case, it may be possible to operate an incorrect virtual processor accidentally. To avoid doing so, **TcrGui** allows users to restrict which processors can be operated, by setting the **TcrGui.ini** file. We also provide **TcrGuiConfigure.exe**, which allows you to create an **.ini** file easier.

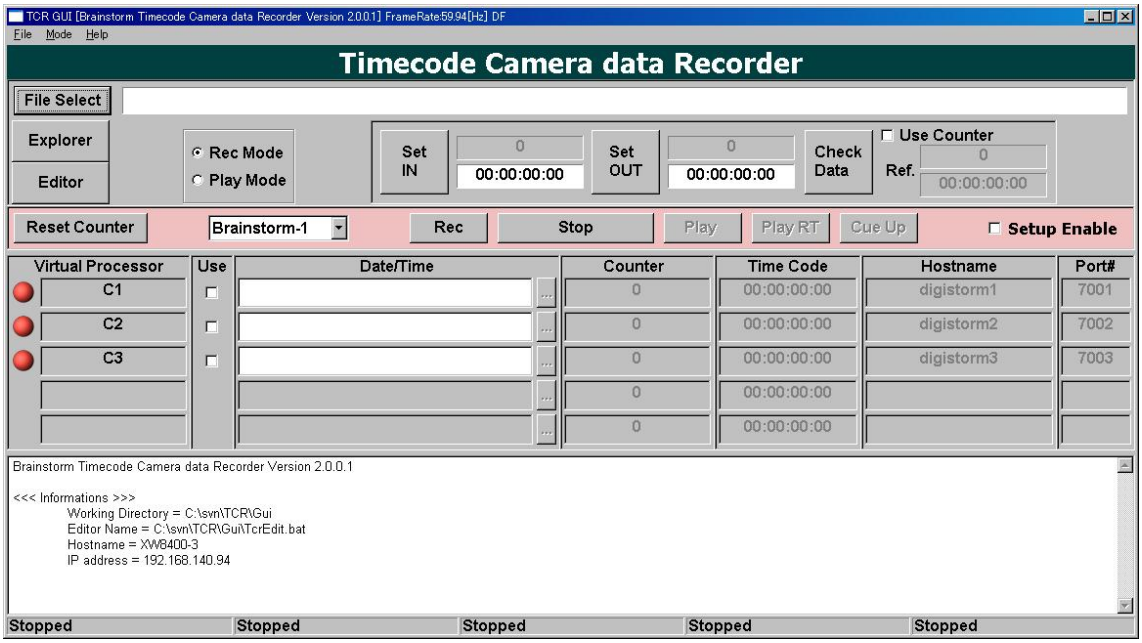
C:\usr\FOR-A\TCR\v2\Gui\TcrGuiConfigure.exe

After the program is started, the following window appears.






For example, to allow only digistorm 1, 2, and 3 to be operated, set as above and click the **Save** button to generate the **TcrGui**.ini file. Closing **TcrGuiConfigure** automatically opens **TcrGui** and the three virtual processors can only be operated as shown in the figure below.



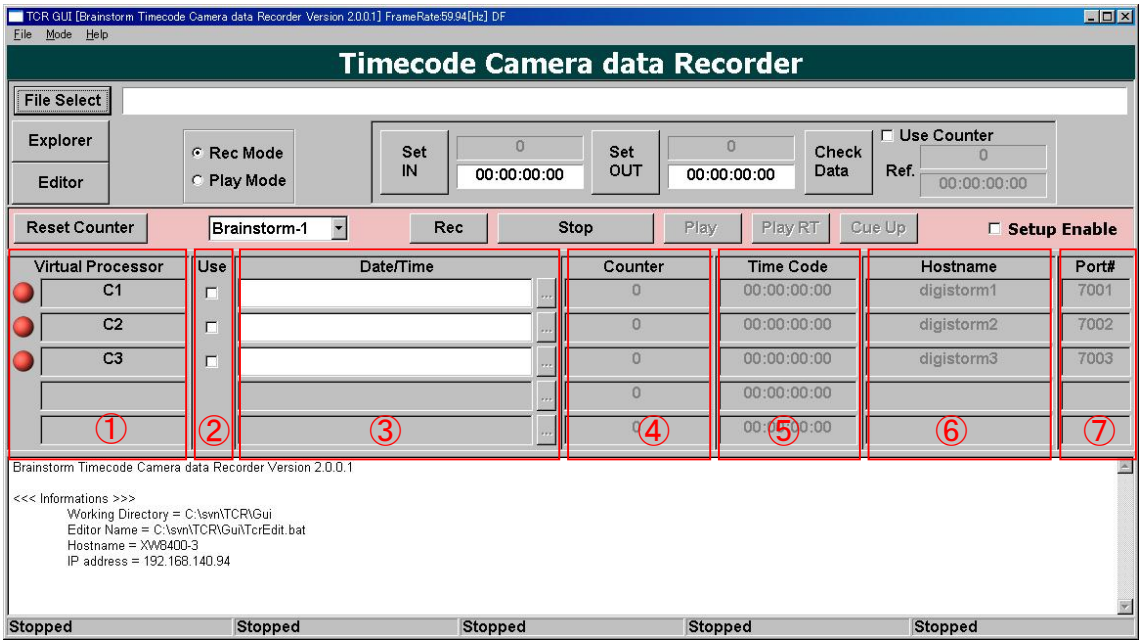

The **TcrGui.ini** file is formatted as below.

```
[Setting]
HostMax=3
itemName=<TCR>TCR1

[Host1]
Address=digistorm1
Port=7001
Alias=C1

[Host2]
Address=digistorm2
Port=7002
Alias=C2
```

[Host3]
Address=digistorm3
Port=7003
Alias=C3
. . .

Note that **itemName** under the **[Setting]** section is the **TCR List** item name used by **TcrGui** when connecting to **Brainstorm**. This Dbs name and item name must actually exist in **Brainstorm**.

## 5-3. Using TcrGui




① Virtual Processor
Allows you to specify the virtual processor name being used. The indicator turns blue while TcrGui is properly communicating with the virtual processor.

② Use
Select the **Use** check box of the virtual processor that is actually being used for recording. If the check box is turned on while the port on the **Little Red** is not opened, the port will open.

③ Date/Time
Displays the recording start date and time. The date and time data is taken from the control PC. If **Create Filename** under the **Mode** menu is set to **Time Code**, the time code data is added after the **Stop** button is clicked. In Play Mode, clicking the button to the right of the **Date/Time** box displays the file selector to select a file to play.

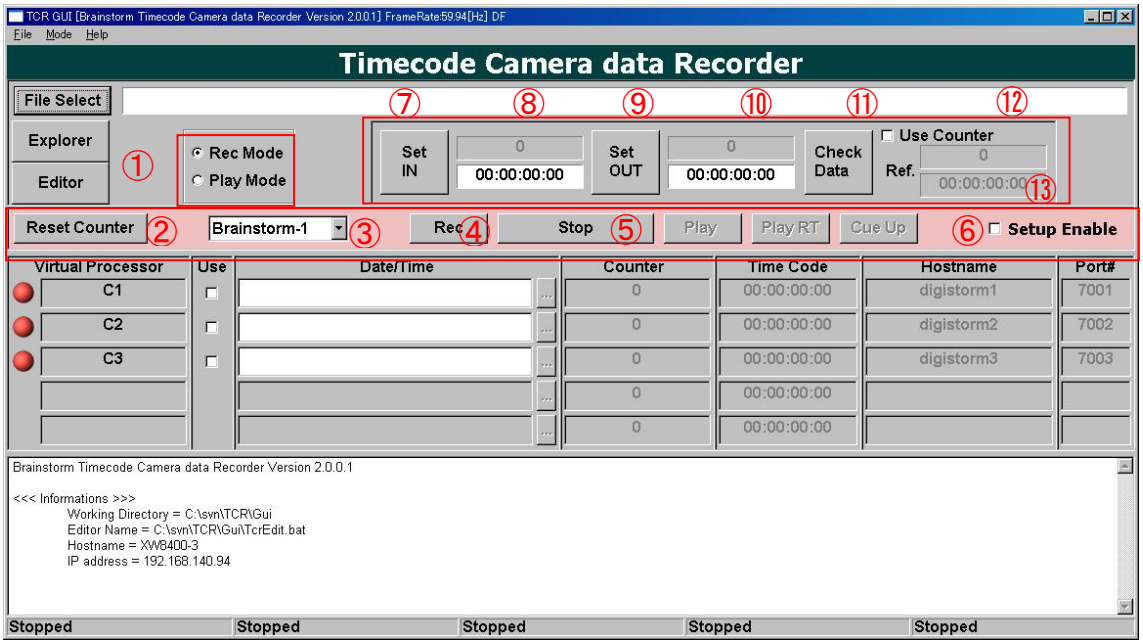
④ Counter
Displays the counter value included in the data sent from TCR Plugin. If the data is correctly received, it will count up almost in real time.

⑤ Time Code
Displays the time code value included in the data sent from TCR Plugin. If the data is correctly received, it will count up almost in real time.

⑥ Hostname
Allows you to specify the name or IP address of the virtual processor being connected. The default setting is the virtual processor specified in the **TcrGui.ini** file. To change the setting, deselect the **Setup Enable** checkbox.

⑦ Port#
Allows you to set the port number for sending and receiving camera data.

| **IMPORTANT** |
| --- |
| **TCR.py** must be loaded into **Brainstorm**, in order to use **TcrGui**, |




① Mode
Allows you to switch between **Rec** and **Play** modes.

② Reset Counter
Resets the counter value of the connected virtual processor.

③ Protocol
Allows you to select the protocol between **Brainstorm-1** and **VizRT-TC** (which can both include time code).

④Rec
Starts recording camera data.

⑤ Stop
Stop recording camera data.

⑥Setup Enable
Enables **Hostname** and **Port#** to be edited.

⑦ Set IN
Allows you to set the IN point in the recording period to **IN data** (⑧).

⑧ IN data
Displays the IN point in the recording file. The upper box is to set the counter value, and the lower box is for the time code value. If the **Use Counter** checkbox is selected, entering the time code and clicking the **ENTER** button automatically calculates the **Counter** value from the **Ref** value (⑬). The value is calculated taking drop frame into consideration.

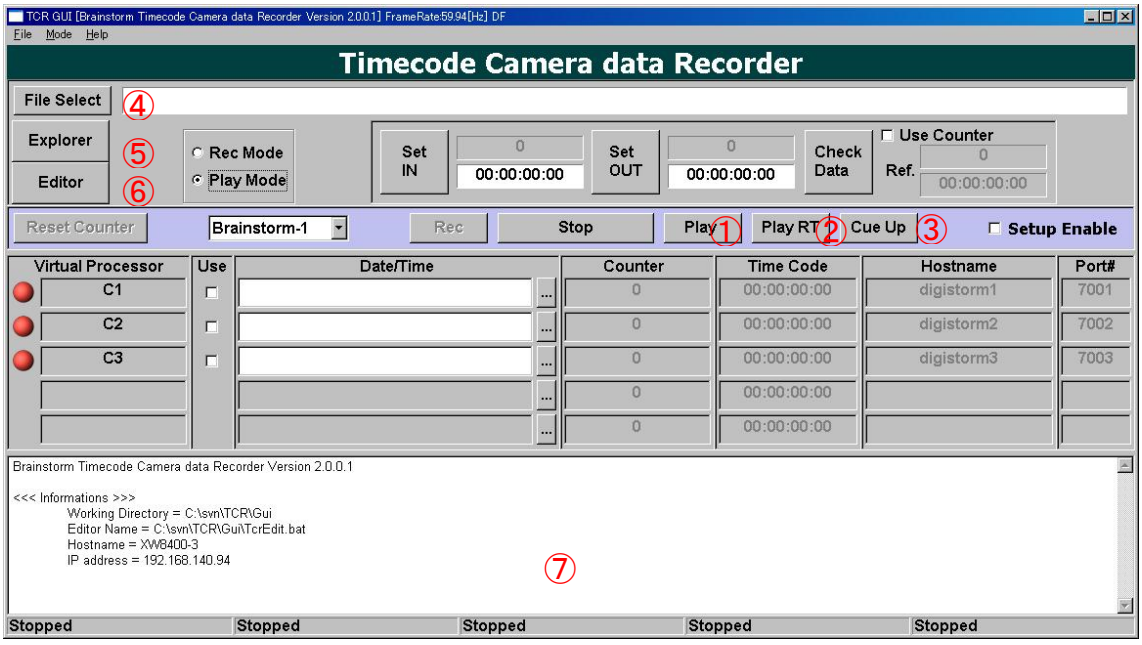
⑨ Set OUT
Allows you to set the OUT point in the recording period to **OUT data** (⑩).

⑩ OUT data
Displays the OUT point in the recording file. The upper box is to set the counter value, and the lower box is for the time code value. If the **Use Counter** checkbox is selected, entering the time code and clicking the **ENTER** button automatically calculates the **Counter** value from the **Ref** value (⑬). The value is calculated taking drop frame into consideration.

⑪ CheckData
Checks if the IN point (⑧) and OUT point (⑩) are included in the recorded file.

⑫ Use Counter
To use the **Counter** value for calculations such as **Check Data**, select the **Use Counter** checkbox.

⑬ Ref.
Allows you to set the reference value for calculating the **Counter** value using the **Time Code** value when the **Use Counter** checkbox is selected.




① Play
Loads the data from the specified file and sends it to the virtual processor. Since the data send timing is based on the control PC's clock, the data playback and recording times are different.

② Play RT
Loads the data from the specified file and sends it to the virtual processor. The data send timing is based on the request command received from the virtual processor. If Brainstorm and TcrGui are running on the same computer, this mode does not function properly.

③ CueUp
Cues up to the IN point displayed under **IN data** (⑧).

④ File Select
Allows you to specify the file being recorded and played. Specify the base name, for example, “Program A”. The actual file name will be followed by the virtual processor name and date and time as shown below. The files are generated by an amount equal to the number of virtual processors.

ProgramAC12006090914h05m05s
ProgramAC22006090914h05m05s
ProgramAC32006090914h05m05s

⑤ Explorer
Allows you to open the folder where the files specified in ④ exist using Explorer.

⑥ Editor
Allows you to open the files specified in ④ using a text editor.

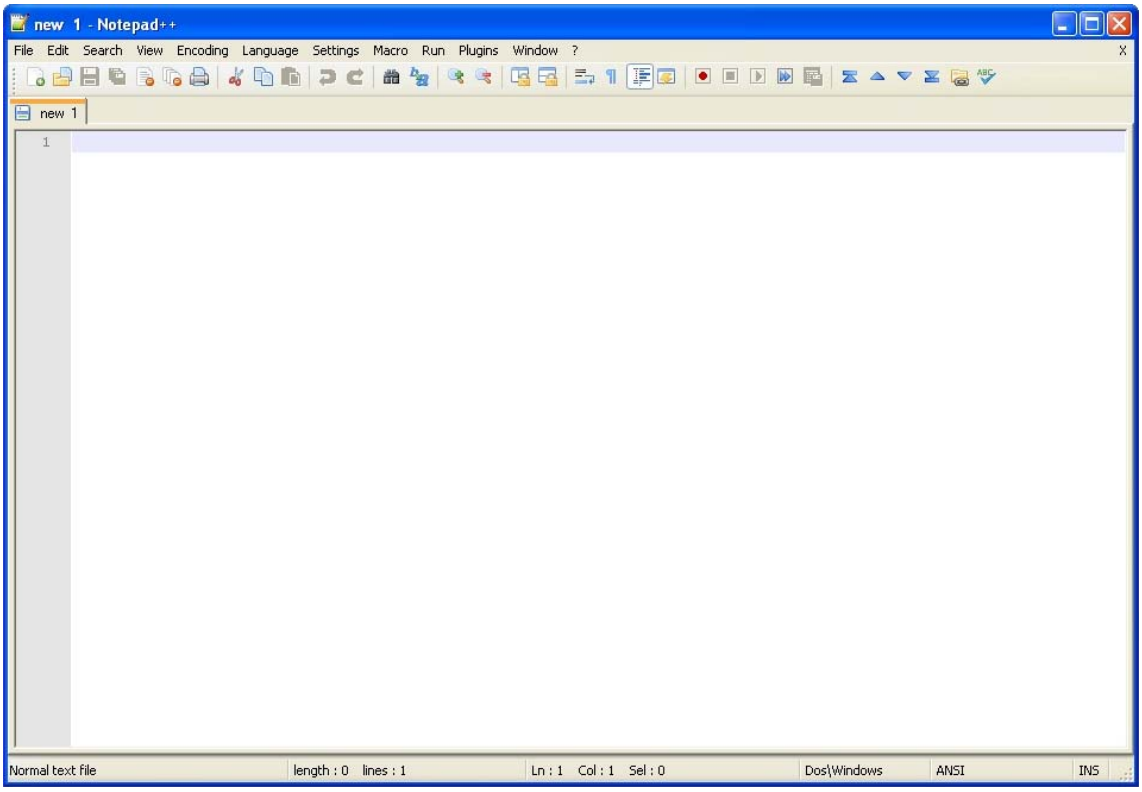
⑦ Message
Displays messages and errors.

# 6. TcrEdit

**TcrEdit** allows you to correct data gaps and errors of the recorded file and set the IN and OUT points using the time code (or counter) values. It can also convert the file to the Maya (.ma) or dotXsi (.xsi) format. This feature is implemented using macros in **Notepad++**, which is a free text editor.

## 6-1. Starting TcrEdit

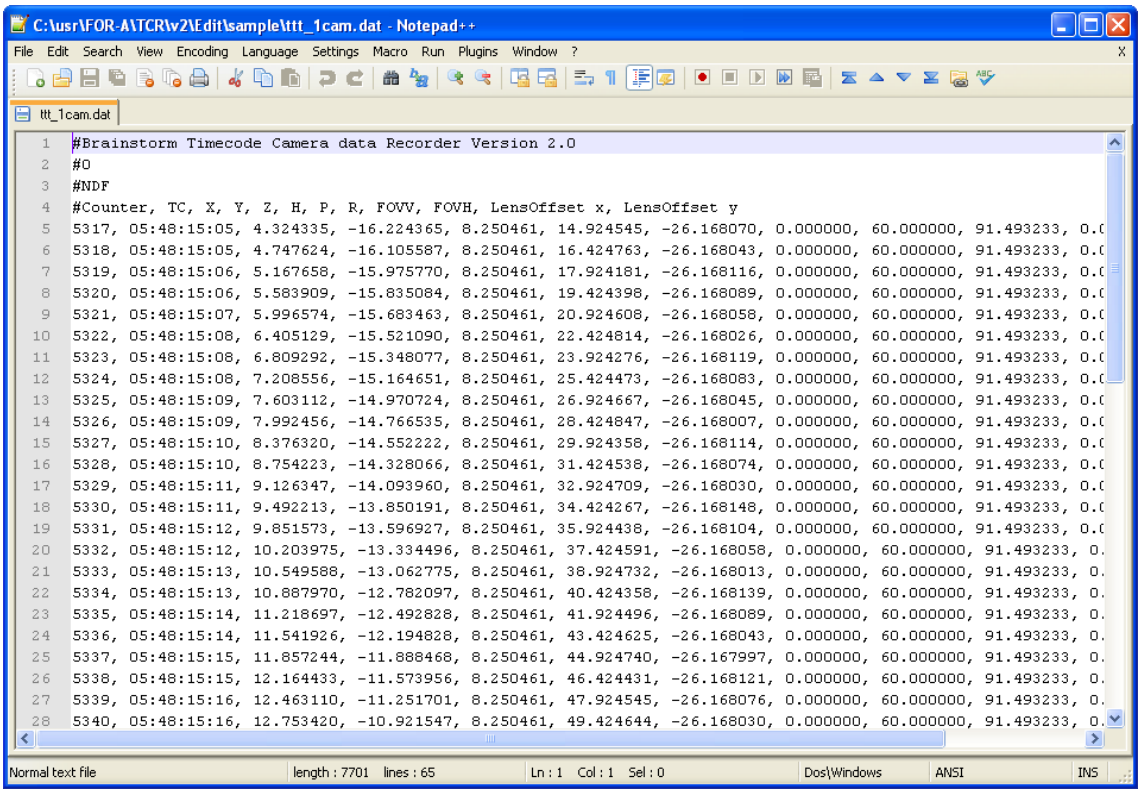
Click the **Editor** button in **TcrGui** or run **TcrEdit.bat** under the following directory:
C:\usr\FOR-A\TCR\v2\Gui\TcrEdit.bat.
The window as shown below appears.



# 6-2. Using TcrEdit

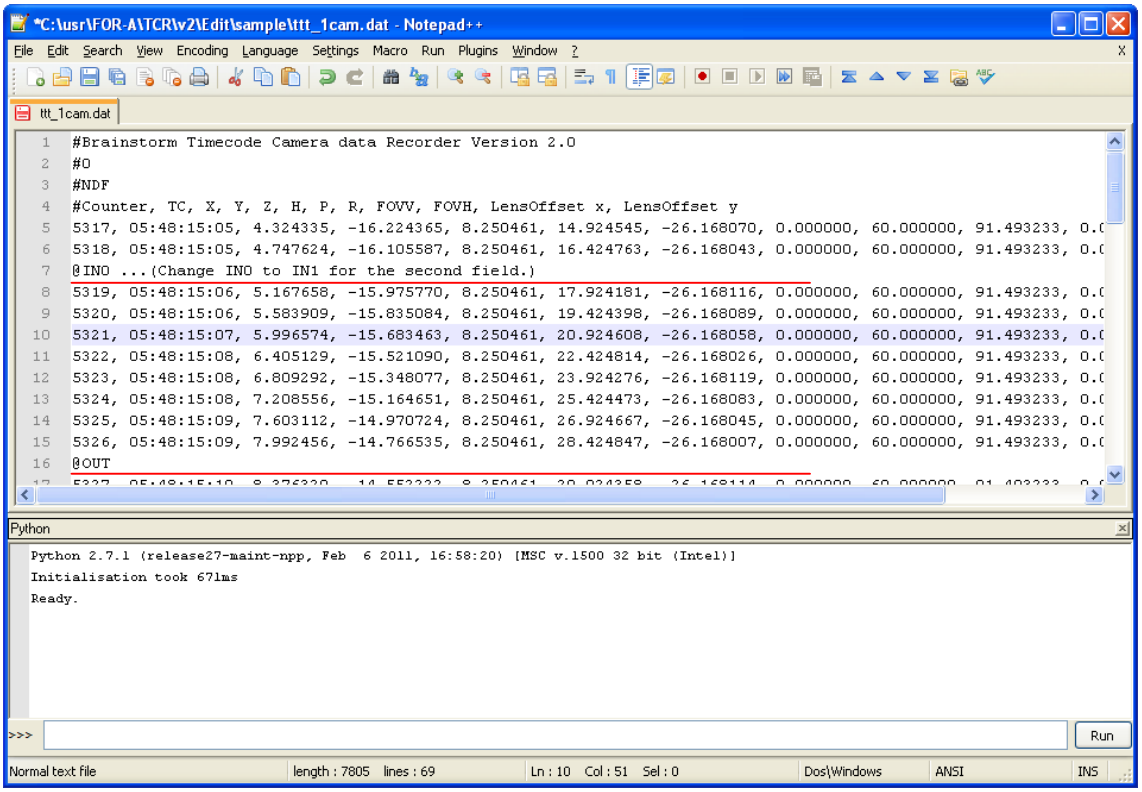
We will not go into details on how to use **Notepad++** as a text editor here.
Load the recorded data located under the following directory.

C:\usr\FOR-A\TCR\v2\Edit\sample\ttt_1cam.dat



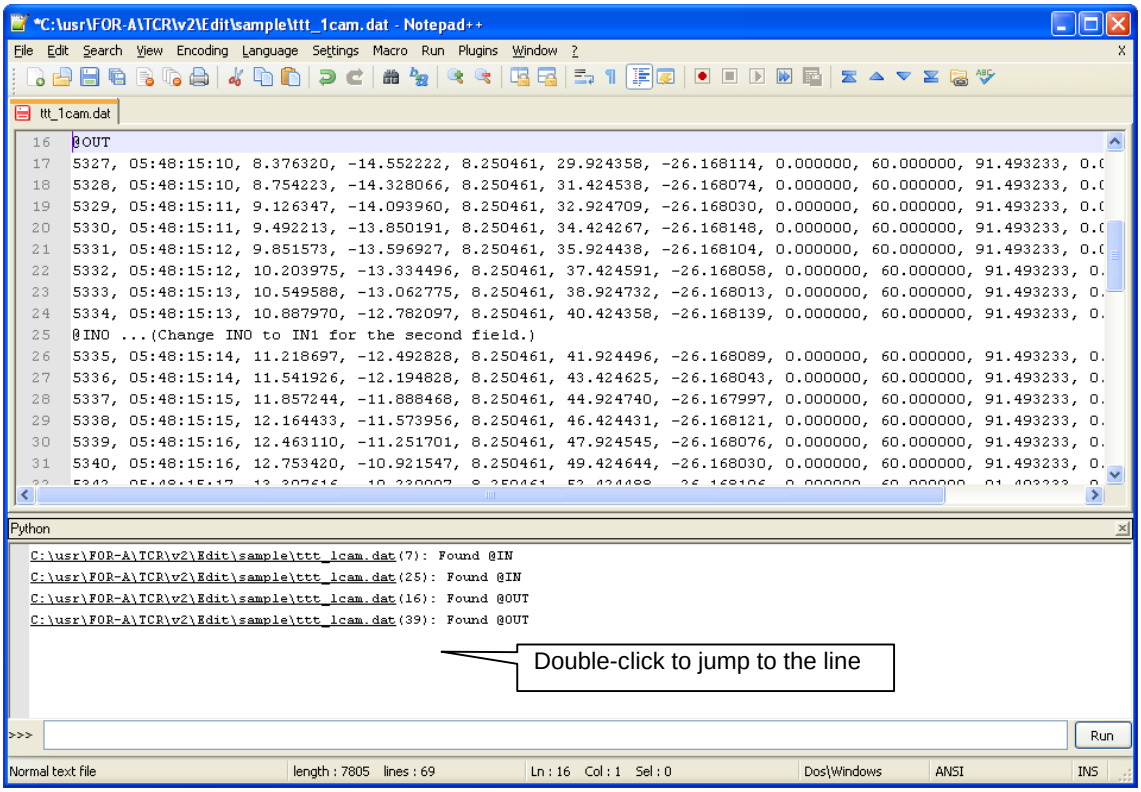
## 6-2-1. Setting IN Point and OUT Point

Move the cursor over the line specified as the IN point and press the F1 key.
A line with “@IN…” that represents the IN point will be inserted.
In the same manner, press the F2 key to insert a line with “@OUT…” that represents the OUT point.



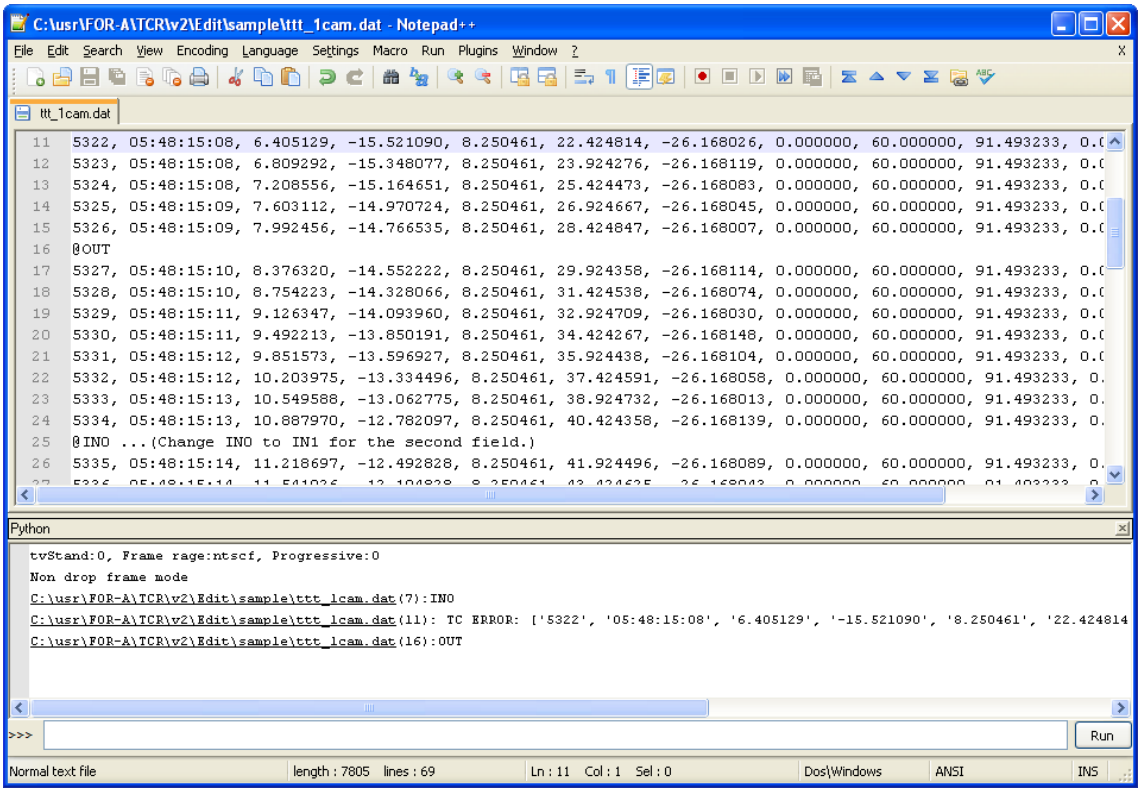
## 6-2-2. Searching for IN Point and OUT Point

If the file size is large, it may be possible for multiple IN or OUT points to be set accidentally. Pressing the F1 key while holding down the SHIFT key allows you to search IN and OUT points that are already set. Make sure that only one IN point and one OUT point are set.



## 6-2-3. Checking and Correcting Errors

Pressing the F5 key checks data gaps and errors in the recorded file. Data gaps are determined by the time code values. If a data gap is found, all subsequent values will be recognized as errors. The error check will be terminated when 10 errors are reached.




In the figure above, “TC ERROR” is reported for situations in which the time code is missing, that is, when there is a data gap. If such errors are reported, double-click the first **TC ERROR** to jump to these time codes. The time code values will be shown as below.

```
 4 5319, 05:48:15:06, 5.167658, -15.975770, 8.250461,
 5 5320, 05:48:15:06, 5.583909, -15.835084, 8.250461,
 6 5321, 05:48:15:07, 5.996574, -15.683463, 8.250461,
 7 5322, 05:48:15:08, 6.405129, -15.521090, 8.250461,
 8 5323, 05:48:15:08, 6.809292, -15.348077, 8.250461,
 9 5324, 05:48:15:08, 7.208556, -15.164651, 8.250461,
10 5325, 05:48:15:09, 7.603112, -14.970724, 8.250461,
11 5326, 05:48:15:09, 7.992456, -14.766535, 8.250461,
12 5327, 05:48:15:10, 8.376320, -14.552222, 8.250461,
```

In the example above, there exists only one line with “05:48:15:07” instead of two lines for two fields. On the other hand, three lines with “05:48:15:08” exist. Such data possesses lower reliability and therefore these fields should be considered “empty fields”. The empty fields will be interpolated in Maya or XSI at the end. For empty fields, add an asterisk (*) to the beginning of the line.

```
 4 5319, 05:48:15:06, 5.167658, -15.975770, 8.250461, 17
 5 5320, 05:48:15:06, 5.583909, -15.835084, 8.250461, 19
 6 5321, 05:48:15:07, 5.996574, -15.683463, 8.250461, 20
 7 *5322, 05:48:15:08, 6.405129, -15.521090, 8.250461, 2
 8 5323, 05:48:15:08, 6.809292, -15.348077, 8.250461, 23
 9 5324, 05:48:15:08, 7.208556, -15.164651, 8.250461, 25
10 5325, 05:48:15:09, 7.603112, -14.970724, 8.250461, 26
11 5326, 05:48:15:09, 7.992456, -14.766535, 8.250461, 28
```

Repeat steps as above to check and correct errors. To represent states, # and @ can also be used in addition to asterisks (*).

| | |
|---|---|
| # | Represents a comment. Ignored for error checks and conversions. |
| @ | Represents the IN or OUT point. |
| * | Represents an empty field. |

## 6-2-4. Checking Errors and Generating a Correct Data File

Pressing the F6 key corrects for any data errors automatically and outputs the corrected data to a separate file. The output file will be named with the original name followed by “out”.

## 6-2-5. Converting For Maya

Load the file with its file name followed by “out” (6-2-4. Checking Errors and Generating a Correct Data File), generated by **Notepad++**. Then press the F8 key to convert the file to the format that can be used in Maya’s y up environment. The output file will be named with the same name as that of the original file and its file extension will be “**.ma**”. To convert the file to the format that can be used in the z up environment, press the F8 key while holding down the SHIFT key. The file should be output to the format having the same coordinate system as that of the scene in Maya for which this data is to be used.

## 6-2-6. Converting For dotXSI

Load the file with its file name followed by “out” (6-2-4. Checking Errors and Generating a Correct Data File), generated by **Notepad++**. Then press the F9 key to convert the file to the format that can be used in dotXSI’s y up environment. The output file will be named with the same name as that of the original file and its file extension will be “**.xsi**”. To convert the file to the format that can be used in the z up environment, press the F9 key while holding down the SHIFT key. The file should be output to the format having the same coordinate system as that of the scene in dotXSI for which this data is to be used.

# 7. Operational Overview

## 7-1. Virtual Processor Setup

To setup a virtual processor, the following item must be prepared.
- Data content used for recording

① Add **TCR.py** to the Loader file.
See section 3-1. “Adding the TCR.py Plug-in Module” for details.

## 7-2. Control PC Setup

To setup a control PC, the following items must be determined.
- Format used for recording
- Time code type (drop frame / non drop frame) used
- Virtual processor used

① Set the **Tcr.ini file** through **TcrGuiConfigure** using the above information.
See sections 4. “TcrGuiConfigure” and 5-2. “Initial Setup” for details.

② Adjust the clock of the control PC to the actual time.

## 7-3. Recording Camera Data

While recording, check whether the data is being recorded for each cut.

① In **TcrGui**, click the **File Select** button to specify the file name and folder to save data. Only alphanumeric characters can be used for the file name.

② Select the **Use** checkbox of the virtual processor to be used and confirm that the red indicator to the left turns blue.

③ Switch to **Rec** mode and click the **Rec** button to start recording camera data. After clicking the **Rec** button, confirm that the **Counter** and **Time code** values change.

④ Click the **Stop** button to stop recording camera data.

⑤ Switch to **Play** mode and click the **Play** button to confirm that the camera data has been recorded.

⑥ Repeat from step ③.

## 7-4. Extracting and Editing Camera Data

To extract any necessary camera data, use **TcrEdit**. If a data error is found, edit the data manually.

See sections 6-2-1. “Setting IN Point and OUT Point”, 6-2-2. “Searching IN Point and OUT Point” 6-2-3. “Checking and Correcting Errors” and 6-2-4. “Checking Errors and Generating a Correct Data File” for details.

## 7-5. Converting Camera Data

Camera data can be converted to the Maya or dotXSI format.

See sections 6-2-5. “Converting For Maya” and 6-2-6. “Converting For dotXSI” for details.

## 7-6. Notes on Rendering in Maya

**TCR Plugin** allows you to convert camera data to the format that can be used in the modeling software. For example, it creates 60 keyframes (started from frame 1) per second for 1080i/59.94. Using Field Render will reduce CPU load compared to using Frame Render. Choose “Both Fields, Interlaced” or “Both Fields, Separate” based on the software used in the later process.
Field Order and Render Resolution depend on the Codecs used in the later process. If the render resolution is changed according to the Codecs, confirm that **Device Aspect Ratio** under **Image Size** is set to **1.777**.

07/01/2011 Printed in Japan

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